

## **REMARKS**

Claims 1-3, 5, and 7-13 are pending. Claims 4 and 6 are canceled. Accordingly, upon entry of the present amendment claims 1-3, 5, and 7-13 are pending.

### **Rejections under 35 U.S.C. § 112, first paragraph**

Claims 1-3, 5 and 7-13, which are directed to methods for controlling spider mites and powdery mildew by applying an emulsion comprising an emulsifier, soap, and hop beta acids, are rejected for allegedly lacking an adequate written description. In support of the rejection the Examiner alleges that the term “soap” is unclear because Applicants fail to provide an explanation of what constitutes liquid soap.

As noted at page 5 in the “Remarks in Support of Request for Continued Examination,” filed August 28, 2008, the term “liquid soap” does not require any explanation beyond what is present in Applicants’ specification because one of skill in the art would understand what is meant by that term. (M.P.E.P. § 2163 II.A.2) Information which is well known in the art need not be described in detail in the specification (*Hybritech, Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1379-80, 231 USPQ 81, 90 (Fed. Cir. 1986)). Liquid soap is well known in the art as evidenced in the extensive use of that term in issued U.S. patent and published U.S. patent applications. A search of the on-line U.S. Patent and Patent publication databases for the term “liquid soap” identified 1,951 U.S. Patents and 1,022 U.S. Patent Publications. Moreover, liquid soap was described and claimed more than one hundred years ago in a U.S. Patent 49,561, entitled “Improved Liquid Soap,” issued in 1865. In view of this extensive and long-standing usage, the term “liquid soap” is well known and requires no explanation beyond the description provided in Applicants’ specification. Accordingly, this basis for the written description rejection is improper and should be withdrawn.

In addition, the Examiner asserts that the term “emulsifier” could encompass liquid soap, citing Locke (column 6, lines 14-17) in support of this assertion. Locke (column 6, lines 14-17) states:

One or more surfactants may typically be used in preparing the insecticide formulations. Non-ionic surfactants will generally be preferred. Examples include, but are not limited to, Triton B-1956, Twee-20, sodium dodecylsulfide and the like. For certain applications, anionic surfactants (such as Ivory ® liquid

soap or the like) may be preferred. Where aqueous diluents or ingredients are used, an emulsifying surfactant should be used.

Thus, Locke supports the concept that liquid soap is one example of a surfactant. More specifically, Locke describes soap as an anionic surfactant. Although anionic surfactants may be one class of emulsifier, the term emulsifier applies to any liquid that stabilizes an emulsion.

Applicants describe the preparation of an aqueous emulsion of beta acids using an emulsifier at page 5, under the heading “Preparation of a 10% Emulsion of Beta Fraction (Beta Acid Oil) for Pest Control.” Applicants teach that “the beta acid fraction was heated to 60°C, and added to a volume of 60°C water, to which an emulsifier, such as Nino FM Tri-Emulsifier, was added . . . The mixture was then emulsified in a high-shear mixer to produce a stable emulsion.” Applicants teach that the emulsion remained stable at all dilutions. Although inclusion of an emulsifier was sufficient to stabilize the beta acid emulsion, the emulsion clogged sprayers when applied to crops in the field. To overcome this problem, liquid soap was added to the emulsion (page 13, lines 5 and 6). Applicants found that inclusion of liquid soap in the emulsion prevented the sprayers from clogging.

Thus, Applicants have plainly described the claimed invention. Specifically, Applicants have described an emulsion comprising beta acids, an emulsifier, and soap. Although soap may in some contexts act as an emulsifier, Applicants’ claims clearly recite an emulsifier and soap. One of skill in the art provided with Applicants’ specification would recognize that Applicants had invented what is claimed *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Moreover, Applicants description of an actual reduction to practice of the claimed methods leaves no doubt as to the fact that Applicants were in possession of the claimed subject matter at the time the application was filed. *In re Smith*, 481 F.2d 910, (CCPA 1973). This is all that is required to satisfy the written description requirement. Accordingly, this basis for the rejection of claims 1-3 and 5-13 should be withdrawn.

In further support of the written description rejection, the Examiner questions data that appears in a Table at page 12, under the heading “Field trial using beta to control two spotted spider mites in commercial hops.” The Examiner alleges that the data summarized in the table is inconsistent with the statement that “The 100 and 200 gallon applications were found to kill

mites at a rate of 100% on lower hop leaves after every application and 85% on upper leaves (page 12, first paragraph).” After reviewing the Table, Applicants have found that certain data appears to be inconsistent with Applicants’ statements in the text. One of skill in the art provided with Applicants’ statements in the specification could carry out the experiments described and confirm the accuracy of Applicants statement that 100 and 200 gallon applications of hop acids killed mites at a rate of 100% on lower hop leaves and 85% on upper leaves. To avoid confusion, upon entry of the present amendment, Applicants delete the Table, which appears at page 12, under the heading “Field trial using beta to control two spotted spider mites in commercial hops.” Applicants provide herewith a declaration summarizing data obtained in field trials using hop beta acid emulsions to control two spotted spider mites in commercial hops. This data supports Applicants’ claims and is consistent with statements made in Applicants’ specification as filed regarding the efficacy of hop acids in controlling two spotted spider mites. This data was acquired prior to the filing of the present application.

In particular, as described in the Declaration of Gene Probasco (hereinafter the “Probasco Declaration”), paragraph 3, Mr. Probasco supervised a confidential field trial using a beta acid emulsion to determine whether beta acids could control two-spotted spider mites in a hop field. The field tests involved applying a 1% beta acid emulsion to three plots at the rate of 20, 100 and 200 gallons per acre, respectively. The beta emulsion was applied by spraying on to the field on June 20, June 26, July 3, July 10, and July 26. (Probasco declaration, paragraph 3) Two control plots were treated with commercially available pesticides such as Agrimek<sup>TM</sup>, Fujimite<sup>TM</sup>, and Acramite<sup>TM</sup>. Agrimek<sup>TM</sup> was applied to the control plots on June 14. Fujimit<sup>eTM</sup> was applied to the control plots on June 21 and July 11. (Probasco declaration, paragraph 4).

After the June 20 application of beta acid emulsion, hop leaves were examined under a dissecting scope. The scope revealed a 100% kill rate for the 100 and 200 gallon applications. The 15 gallon application resulted in a 50% or less kill rate after 24 hours (Probasco declaration, paragraph 5). One week after application of the beta acid emulsion, mite eggs hatched on the leaves that received the 100 and 200 gallon applications. The leaves that had received the 15 gallon application still had adults present (Probasco declaration, paragraph 6).

Visual inspection of leaves in the lab 30 hours after the June 26 application showed 100% kill rate following the 200 gallon application. 90% kill rate was observed following the 100

gallon application. Less than 50% kill rate was observed following the 15 gallon application. (Probasco declaration, paragraph 7) Prior to the July 3 spray application, a pre-spray visual inspection in the plots revealed the presence of mites in all rows. More mites were present in the control plots that had been treated with conventional miticides than in the plots that had been treated with beta acids. (Probasco declaration, paragraph 8)

Visual inspection after the July 3 spray showed 100% kill rate following the 200 gallon application. A 100% kill rate was observed following the 100 gallon application. A 50% kill rate was observed following the 15 gallons. Mites were present in control fields following treatment with conventional miticides. (Probasco declaration, paragraph 9)

A visual inspection on July 6, three days after the July 3 application of beta acids, showed that no living mites were present in the plot that received the 200 gallon spray application. Few live mites were observed in the plot that received the 100 gallon spray application. More living mites were present in the plot that received the 15 gallon spray application. Leaves collected prior to spray application and maintained in the lab continued to have large numbers of mites present. (Probasco declaration, paragraph 10)

On July 16, six days after the July 10 application of beta acids, a visual inspection of leaves six feet above the base of the vine, showed that the beta acid spray applications were very effective in killing mites on both main and lateral leaves of the hop vine. Very few mites were observed in plots that received the 100 and 200 gallon spray applications. The 15 gallon spray application was less effective in controlling mites on main and lateral leaves. (Probasco declaration, paragraph 11) On July 24, approximately two weeks after the July 10 application of beta acids, a visual inspection of leaves 8 feet above the base of the vine was conducted. The plot that received the 100 and 200 gallon beta acid application continued to show good mite control on both the main vine and lateral leaves. Although some live mites were observed, these mites were generally young suggesting they had recently hatched. (Probasco declaration, paragraph 12)

On July 27, one day after the July 26 beta acid application, leaves from the top of the plants were examined. An 85% mite kill rate was observed for leaves at the top of the vine following the 100 and 200 gallon application. Live mites were observed in the plot that received the 15 gallon beta acid application. (Probasco declaration, paragraph 13) In sum, the 100 and 200 gallon applications killed mites at the rate of 100% on lower hop leaves and 85% on upper

leaves after each application. The 15 gallon application was less effective at controlling mites. (Probasco declaration, paragraph 14)

In sum, the specification as filed, including the literal text therein as well as description and experimental details of the technology fully support and teach one of ordinary skill in the art the functionality of the technology. Further, the Probasco declaration supports the statements made in Applicants' specification regarding mite control with beta acid emulsions. Accordingly, this basis for the written description rejection should be withdrawn.

### **Rejections under 35 U.S.C. § 103(a)**

Claims 1-3, 5, and 7-13, which are directed to methods of controlling spider mites or powdery mildew by applying an emulsion to an agricultural crop, are rejected under 35 U.S.C. 103(a) as allegedly obvious over Jones' thesis (hereinafter "Jones") in view of Locke. Applicants respectfully disagree and traverse the rejection.

#### *Jones*

Jones describes producing ethanolic solutions that contain 10% water and 0.1%, 1%, or 10%  $\beta$ -fraction of hops acids in 80%, 89%, or 89.9% ethanol, respectively. As characterized by the Examiner, Jones found that beta acids repelled spider mites. Jones fails to teach or suggest that beta acids should be applied in an emulsion. In fact, Jones fails entirely to address the subject of emulsions.

To remedy the deficiencies of Jones, the Examiner cites Locke. However, for reasons delineated below, Locke fails to remedy the deficiency of Jones. Locke fails to describe hop beta acids, nor provide any rationale why one would be motivated to extrapolate the Locke subject matter relating to neem oil to Applicants' claimed subject matter, i.e. hop beta acid formulations.

The Examiner seeks to provide motivation to combine Jones with Locke by alleging that Jones describes the use of azadirachtin, a compound extracted from neem seed. In particular, the passage at page 65 cited by the Examiner states:

Some compounds such as azadirachtin, extracted from neem seed kernels, have attracted particular attention. Mansour et al. (1987) found a 0.1% solution of **azadirachtin extracted in pentane**, caused 70% mortality in the carmine spider mite, *T. cinnabarinus* (Boisd.), whilst Schauer and Schmutterer (1980) reported

some residual toxicity against *T. urticae*. The laboratory results reported here indicate that the  $\beta$ -fraction was less effective than azadirachtin. In the double-leaf-disk assay (experiment 6) approximately 50% of mites died after 3 days exposure to residues from a 10% solution.

Applicants respectfully disagree that Jones provides such motivation. Contrary to the Examiner's allegation, Jones fails to suggest combining azadirachtin and hops beta acids. Jones merely indicates that the ethanolic solutions he tested are less effective than published results with azadirachtin. Jones fails to teach or suggest that azadirachtin should be used in combination with hop acids, and thus fails to provide the requisite motivation that would lead one of skill in the art to combine Jones with Locke.

Moreover, Applicants' claims are not directed to the use of hop acids in combination with azadirachtin and/or neem oil. Applicants' claims are directed to methods of controlling spider mites by applying an emulsion comprising an emulsifier, soap, and hop beta acids. Jones fails to teach or suggest the use of aqueous emulsions of hop beta acids to control spider mites. The Examiner has failed to provide any logic or reasoning to support his assertion that the "combination of JONES hops beta acids with LOCKE neem seed compositions would be expected to increase the efficacy of killing and repelling plant pests."

#### *Locke*

Locke describes insecticidal compositions comprising neem oil and soap. Locke states that neem oil "can be applied as a soap . . . to repel insects and protect skin or wool from insect and fungal attack (column 4, line 67, to column 5, line 2)." Locke fails to mention hop beta acids. Therefore, Locke fails to teach or suggest applying an emulsion comprising 1.0% hop beta acids and soap to crops, where the soap is present in an amount sufficient to reduce film formation.

To establish a prima facie case of obviousness, the Examiner must first show that there is a suggestion or motivation to modify the reference or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference must teach or suggest all the claim limitations. M.P.E.P. 2143. In the absence of a showing that the references expressly or impliedly suggest all of the claim limitations the rejection under § 103 is improper and must be withdrawn. M.P.E.P. 2142.

One of ordinary skill in the art would simply not combine the neem oil soap described by Locke as useful in repelling insects from skin and wool with the solutions described by Jones to arrive at Applicants' claimed method of applying an emulsion comprising hop beta acids and soap in an amount sufficient to reduce film formation. The aforementioned motivation to combine the references as well as the requisite reasonable expectation of success are both absent here. The cited references fail to teach or suggest all of the claim limitations. Thus, Applicants submit that a *prima facie* case is not established based on Jones in view of Locke. None of the cited references, alone or in any combination is sufficient to support the rejection of the claims under 35 U.S.C. § 103. Thus, withdrawal of the rejection is respectfully requested.

## CONCLUSION

In view of the above amendment, Applicants believe the pending application is in condition for allowance. Should any of the claims not be found to be allowable, the Examiner is requested to telephone Applicants' undersigned representative at the number below. Applicants thank the Examiner in advance for this courtesy.

Applicants believe that no additional fees are required for consideration and entry of this paper. Nevertheless, Applicants hereby authorize the Director to charge any deficiency in the fees filed, asserted to be filed or which should have been filed herewith (or with any paper hereafter filed in this application by this firm) or credit any overpayment to Deposit Account No. 04-1105, under order no 61842CIP(51035).

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